



Glenn Research Center



Spacecraft Fire Safety Systems' Features

	Shuttle	ISS	Mir
Number of Detectors	9 in avionics' cooling air near flight and mid decks; 6 in Spacelab	2 in each U.S. element; 10 in the Russian Functional cargo Block and the Service Module; 1 in each rack containing an avionics' air cooling assembly	10 in Core; 10 in Kvant and Krystall modules; tied together with central monitoring system and telemetry capability
Type of Detectors	Ionization with integral sampling fan and aerodynamic separator to reject large particles	Photoelectric scattering (30° forward) in U.S. elements; ionization in Russian Functional Cargo Block; photoelectric in Russian Service Module	Photoelectric light attenuation
Alarm Criteria	Particulate density > 2 mg/m ³ for 5 s or rise rate of 22 mg/m ³ s for 20 s	Voltage threshold corresponding to 3.1% obscuration per meter at 0° angular scatter	"> 4% obscuration (no dimensions provided)"; also, in Core Module, visual detection of smoke or open fire, while in Kvant and Krystall, a pair of detectors required at this level of obscuration for alarm
Sensitivity	Insensitive to particulate >1-2 microns	Insensitive to particulate < 0.3 microns	
Number of Extinguishers	3 fixed in avionics near flight and mid decks; 4 portable	1-2 in each U.S. element; 2-3 in each Russian module	2 per module
Type of Extinguisher	Portable units, fixed units + automated venting systems	Portable units + venting systems	Portable
Suppressant	Halon 1301	Carbon Dioxide	Distilled water in foam